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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/716,986	11/19/2003	Daniel Grier Osborne	P10-1439	7590

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EXAMINER	
JULES, FRANTZ F	

ART UNIT	PAPER NUMBER
3617	

DATE MAILED: 02/01/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/716,986	OSBORNE ET AL.	
	Examiner	Art Unit	
	Frantz F. Jules	3617	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *16 December 2005*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-29* is/are pending in the application.

4a) Of the above claim(s) *7-11* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-6, 12-29* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

1 The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2 Claims 1-6, 12-13, 18-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Suzuki (EP 0790143 A1) in view of Choi et al (US 2002/01,951,85A1)

Claims 1-6, 12-13

Suzuki discloses a tire comprising a crown (2) extended by two respective sidewalls and two respective beads, a carcass structure anchored in each side of the tire in said beads, said crown comprising at lest one reinforcing ply (7) having parallel reinforcements oriented at an angle relative to the circumferential direction ranging between 10 to 45 degrees as disclosed in col 3, lines 29-30, a first crown reinforcement having cords (9A) substantially oriented in the circumferential direction and being high elastic modulus at high stress organic fiber cords, and a second reinforcement cords (9B) substantially oriented in the circumferential direction which are organic fibre cords such as polyester, nylon, rayon, aromatic polyamide.

The crow further comprises a pair of axially spaced edge plies (7A, 7B) at section labeled (WE) in accordance with claim 12.

The outer contour of the crown portion of the tire having a transverse concave profile with a substantially constant radius of curvature over 1.0 meter in accordance with claim 15.

Suzuki discloses all of the features as disclose above but does not disclose a tire comprising cords having a ratio of the tensile strength at high strain and high temperature to the tensile strength at low strain and moderate temperature inferior to 1.5. The general concept of providing cords having a ratio of the tensile strength at high strain and high temperature to the tensile strength at low strain and moderate temperature inferior to 1.5 is well known in the art as illustrated by Choi et al which discloses the teaching of a tire comprising cords having a ratio of the tensile strength at high strain and high temperature to the tensile strength at low strain and moderate temperature inferior to 1.5, see col 1, last paragraph, col 2, lines 1-2. It would have been obvious to one of ordinary skill in the art at the time of the invention to modify Suzuki to include the use of cords having a ratio of the tensile strength at high strain and high temperature to the tensile strength at low strain and moderate temperature inferior to 1.5 in his advantageous tire as taught by Choi et al in order to reduce the risk of breaking of the chords under cyclic loading thereby increasing the service life of the tire.

Claims 18-19

Regarding the limitations of claims 18-19, the cords of Choi et al being made of polyester are inherently possessing the claimed property of a tensile strength of the second crown reinforcement cords at a strain of 2.5% and a temperature of 180 Celsius

degrees being inferior to 2 daN and preferably inferior to 1.5 daN or superior to 2 daN as recited in claims 18-19 since from the specification the property is substantially a function of cord material. In addition, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify Suzuki and Choi et al to include the use of tensile strength of the second crown reinforcement cords at a strain of 2.5% and a temperature of 180 Celsius degrees being inferior to 2 daN and preferably inferior to 1.5 daN or superior to 2 daN in his advantageous system, as cord reinforcement design is a common and everyday occurrence throughout the tire design art and the specific use of tensile strength of the second crown reinforcement cords at a strain of 2.5% and a temperature of 180 Celsius degrees being inferior to 2 daN and preferably inferior to 1.5 daN or superior to 2 daN would have been an obvious matter of design preference depending upon such factors as the loading to be carried by the tire, the yield strength of the tire and cord reinforcement material, the desired vibration characteristic; the ordinarily skilled artisan choosing the best stress profile corresponding to a particular loading imposed on the tire which would most optimize the cost and performance of the device for a particular application at hand, based upon the above noted common design criteria.

3. Claims 14-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Suzuki and Choi et al as applied to claim 1 above, and further in view of Kojima et al (US 5,032,198).

Suzuki teaches all the limitations of claims 14-17 except for a tire comprising two crossed reinforcing plies of high elastic modulus cords of diameter between 0.5mm to 1.2 mm which are laid at inclination angle from 27 to 37 degrees. The general concept of providing a tire with crossed reinforcing plies of high elastic modulus cords of diameter between 0.5mm to 1.2 mm which are laid at inclination angle from 27 to 37 degrees is well known in the art as illustrated by Kojima et al which discloses the teaching of a tire comprising two crossed reinforcing plies of high elastic modulus cords (8e, 8f) of diameter between 0.5mm to 1.2 mm which are laid at inclination angle from 27 to 37 degrees, see col 6. lines 48-50, col 9, lines 17-21. It would have been obvious to one of ordinary skill in the art at the time of the invention to modify Suzuki and Choi et al to include the use of a tire comprising two crossed reinforcing plies of high elastic modulus cords of diameter between 0.5mm to 1.2 mm which are laid at inclination angle from 27 to 37 degrees in his advantageous tire as taught by Kojima et al in order to increase the strength of the tire thereby reducing the risk of early failure.

4. Claims 20-23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Suzuki and Choi et al (US 2002/0195185 A1) as applied to claim 1 above, and further in view of Sykora et al (US 6,634,399).

Claims 20-21

Suzuki and Choi et al teach all the limitations of claims 20-23 except for a tire wherein the second crown reinforcement cords are chosen from the group of PET and PEN polyesters with PET cords. The general concept of using crown reinforcement cords

are chosen from the group of PET and PEN polyesters with PET cords in a tire is well known in the art as illustrated by Sykora et al which disclose crown reinforcement cords are chosen from the group of PET and PEN polyesters with PET cords, see col 6, line 2, lines 16-20. It would have been obvious to one of ordinary skill in the art at the time of the invention to modify Suzuki and Choi et al the use of crown reinforcement cords are chosen from the group of PET and PEN polyesters with PET cords in his advantageous tire as taught by Sykora et al in order to increase the strength of the tire while reducing the weight of the tire.

Regarding the limitations of claims 22-23, the cords of Choi et al being made of polyester material are inherently possessing the claimed property of PET polyester cords having a stress-strain characteristic with two maxima of tangent modulus with the strain of the second maxima being over 12% and preferably over 14% PET HMLS cords with a high temperature contraction potential under 1% since from the specification the property is substantially a function of the cord material. In addition, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify Suzuki and Choi et al to include the use of PET polyester cords having a stress-strain characteristic with two maxima of tangent modulus with the strain of the second maxima being over 12% and preferably over 14% PET HMLS cords with a high temperature contraction potential under 1% in his advantageous system, as cord reinforcement design is a common and everyday occurrence throughout the tire design art and the specific use of PET polyester cords having a stress-strain characteristic with two maxima of tangent modulus with the strain of the second maxima being over 12% and

preferably over 14% PET HMLS cords with a high temperature contraction potential under 1% would have been an obvious matter of design preference depending upon such factors as the loading to be carried by the tire, the desired vibration characteristic; the ordinarily skilled artisan choosing the best stress profile corresponding to a particular loading imposed on the tire which would most optimize the cost and performance of the device for a particular application at hand, based upon the above noted common design criteria.

5. Claims 24-29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Suzuki and Choi et al (US 2002/0195185 A1) as applied to claim 1 above, and further in view of Sheperd et al (US 4,155,394).

Claims 24-29

Suzuki and Choi et al teach all the limitations of claims 24-26 except for a tire comprising high elastic modulus at high strain cords comprising nylon yarn associated with aramid yarn or cords that are helically wound. The general concept of providing high elastic modulus at high strain cords comprising nylon yarn associated with aramid yarn or cords that are helically wound is well known in the art as illustrated by Shepherd which discloses the teaching of tire comprising high elastic modulus at high strain cords comprising nylon yarn associated with aramid yarn or cords that are helically wound, see col 9, lines 26-37. It would have been obvious to one of ordinary skill in the art at the time of the invention to modify Suzuki and Choi et al to include the use of high elastic modulus at high strain cords comprising nylon yarn associated with aramid yarn

or cords that are helically wound in his advantageous tire as taught by Sheperd et al in order to gain the benefit of their combined properties while reducing early failure in the tire.

Response to Arguments

6. Applicant's arguments filed 12/16/2005 have been fully considered but they are not persuassive.

A. Summary of applicant's argument

In the amendment, the applicant traverse the rejection of the claims for the following reasons:

1. The prior art cited in the combination rejection, Choi, fails to meet the claim limitation of a second crown reinforcement having a ratio of strain < 1.5 as there is no teaching or suggestion in Choi that the ratio S3/S4 be taken at high strain/low strain as claimed by claim 1.

2. The prior art references fail to disclose a first crown reinforcement and a second crown reinforcement and additionally a pair of axially spaced edge plies as in claim 12.

B. Response to applicant's argument.

1. In response to applicant's argument number one, it's factual and a well known mechanical engineering design concept that from the elastic strain theory, stress is proportional to strain. This has been defined by Hook's law and has been taught in strength of material course, see the attached page 33 from the Mechanical Design Engineering manual, 4th paragraph. Strain being defined as elongation or the amount of stretch undergo by a structure when subject to tensile load or increase in temperature.

Thus, tensile strength is directly proportional to strain from the definition of elastic strain, see paragraph 2-5, page 33 of the Mechanical Design Engineering manual which states that "When a straight bar is subjected to a tensile load, the bar becomes longer. The amount of stretch, or elongation, is called strain". Also, as regard to temperature effect, page 63 of the Mechanical Engineering Design manual disclose that strain is proportional to the increase in temperature, see section 2-19 Temperature effects. Therefore, it is well known in the art of engineering design from a strength of material standpoint that the strain level at higher temperature is higher than that of a lower temperature.

The Choi et al reference used in the rejection of the claims discloses as quoted by applicant's on pg 6-7 of the remark a "ratio S3/S4, which is defined as the tensile strength at high temperature to the tensile strength at room temperature" which is equal to 0.75. This ratio t of tensile strength at high temperature to tensile strength at low temperature meets the limitation of a ratio t of the tensile strength at high temperature to low strain at moderate temperature inferior to 1.5 recited in claim 1. It is also important to note that Suzuki'143 discloses the use of polyester cords (9A, 9B) and the Choi et al'185 reference also disclose the use of polyester cord having a ratio of tensile strength S3 at high temperature to the tensile strength S4 at low temperature being equal to 0.75, see col 1 of Choi et al'185, last two paragraphs. Therefore, an ordinarily skilled artisan would have been motivated to incorporate the use of a second crown reinforcement having a ratio t of the tensile strength at high strain and high temperature

to low strain at moderate temperature inferior to 1.5 in order to increase the service life of the tire.

In response to applicant's argument that there is no suggestion to combine the references, the examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988)and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). In this case, an ordinarily skilled artisan would have been motivated to incorporate the teaching of a cord reinforcement having a ratio t of the tensile strength at high strain and high temperature to low strain at moderate temperature inferior to 1.5 of Choi et al'185 into the Suzuki'143 in order to achieve among others the benefit of increasing the stability of the tire at higher temperature range.

2. in response to applicant's argument number two, it must be noticed that the structre of the Suzuki'143 reference disclose first and second crown cord reinforcements (9A, 9B) in addition to a pair of axially spaced edge plies (7A, 7B) as one can clearly see in figure the axial spacing of the edges of the plies 7A, 7B at the crown of the tire which is shown in section indicated (WE).

Conclusion

7. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Frantz F. Jules whose telephone number is (703) 308-8780. The examiner can normally be reached on Monday-Thursday and every other Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Joseph S. Morano can be reached on (703) 308-0230. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Frantz F. Jules
Primary Examiner
Art Unit 3617

FFJ

January 28, 2006

FRANTZ F. JULES
PRIMARY EXAMINER